

EXHIBIT 4

U.S. Serial No. 09/934,773

Substitute paper copy of
the Sequence Listing

SEQUENCE LISTING

<110> Reiter, Robert E.
Witte, Owen N.
Saffran, Douglas C.
Jakobovits, Aya

<120> PSCA: PROSTATE STEM CELL ANTIGEN AND USES THEREOF

<130> 30435.54USD3

<140> 09/934,773

<141> 2002-08-21

<150> 09/564,329

<151> 2000-05-03

<150> 09/359,326

<151> 1999-07-20

<150> 09/318,503

<151> 1999-05-25

<150> 09/251,835

<151> 1999-02-17

<150> 09/203,939

<151> 1998-12-02

<150> 09/038,261

<151> 1998-03-10

<150> 60/124,658

<151> 1999-03-16

<150> 60/120,536

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<150> 60/074,675

<151> 1998-02-13

<150> 60/071,141

<151> 1998-01-12

<150> 60/228,816

<151> 1997-03-10

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<170> PatentIn Ver. 2.1

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gcctgcaggt ggagaactgc acccagctgg gggagcagtg ctggaccgcg cgcacccgcg 180
cagttggcct cctgaccgtc atcagcaaag gctgcagctt gaactgcgtg gatgactcac 240
aggactacta cgtgggcaag aagaacatca cgtgctgtga caccgacttg tgcaacgcca 300
gcggggccca tgccctgcag ccggctgccg ccaccccttc gctgctccct gcactcggcc 360
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ggtgtggtgc cccaggcctt tgtgccactc ctcacagaac ctggcccagt gggagcctgt 480
cctggttctt gaggcacatc ctaacgcaag tttgaccatg tatgtttgca ccccttttcc 540
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acaagagttg acgtgagttc ctgggagttt ccagagatgg ggcctggagg cctggaggaa 900
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      20             25            30

Glu Asp Cys Leu Gln Val Glu Asn Cys Thr Gln Leu Gly Glu Gln Cys
      35             40            45

Trp Thr Ala Arg Ile Arg Ala Val Gly Leu Leu Thr Val Ile Ser Lys
      50             55            60

Gly Cys Ser Leu Asn Cys Val Asp Asp Ser Gln Asp Tyr Tyr Val Gly
      65             70            75            80

Lys Lys Asn Ile Thr Cys Cys Asp Thr Asp Leu Cys Asn Ala Ser Gly
      85             90            95

Ala His Ala Leu Gln Pro Ala Ala Ala Ile Leu Ala Leu Leu Pro Ala

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100

105

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 aagccaccca ccaccctggg gctgctgacc gtgctctgca gcctgttgct gtggggctcc 360
 agccgtctgt aggcctctggg agagcctacc atagcccgat tgtgaaggga tgagctgcac 420
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<211> 123

<212> PRT

<213> MURINE PSCA (mPSCA)

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Arg Asp Cys Leu Asn Val Gln Asn Cys Ser Leu Asp Gln His Ser Cys
 35 40 45

Phe Thr Ser Arg Ile Arg Ala Ile Gly Leu Val Thr Val Ile Ser Lys
 50 55 60

Gly Cys Ser Ser Gln Cys Glu Asp Asp Ser Glu Asn Tyr Tyr Leu Gly
 65 70 75 80

Lys Lys Asn Ile Thr Cys Cys Tyr Ser Asp Leu Cys Asn Val Asn Gly
 85 90 95

Ala His Thr Leu Lys Pro Pro Thr Thr Leu Gly Leu Leu Thr Val Leu
 100 105 110

Cys Ser Leu Leu Leu Trp Gly Ser Ser Arg Leu
 115 120

<210> 5

<211> 131

<212> PRT

<213> HUMAN STEM CELL ANTIGEN (hSCA-2)

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20 25 30

Leu Tyr Cys Leu Lys Pro Thr Ile Cys Ser Asp Gln Asp Asn Tyr Cys
35 40 45

Val Thr Val Ser Ala Ser Ala Gly Ile Gly Asn Leu Val Thr Phe Gly
50 55 60

His Ser Leu Ser Lys Thr Cys Ser Pro Ala Cys Pro Ile Pro Glu Gly
65 70 75 80

Val Asn Val Gly Val Ala Ser Met Gly Ile Ser Cys Cys Gln Ser Phe
85 90 95

Leu Cys Asn Phe Ser Ala Ala Asp Gly Gly Leu Arg Ala Ser Val Thr
100 105 110

Leu Leu Gly Ala Gly Leu Leu Leu Ser Leu Leu Pro Ala Leu Leu Arg
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Phe Gly Pro
130

<210> 6

<211> 123

<212> PRT

<213> HUMAN PSCA (hPSCA)

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Pro Gly Thr Ala Leu Leu Cys Tyr Ser Cys Lys Ala Gln Val Ser Asn
20 25 30

Glu Asp Cys Leu Gln Val Glu Asn Cys Thr Gln Leu Gly Glu Gln Cys
35 40 45

Trp Thr Ala Arg Ile Arg Ala Val Gly Leu Leu Thr Val Ile Ser Lys
50 55 60

Gly Cys Ser Leu Asn Cys Val Asp Asp Ser Gln Asp Tyr Tyr Val Gly
65 70 75 80

Lys Lys Asn Ile Thr Cys Cys Asp Thr Asp Leu Cys Asn Ala Ser Gly
85 90 95

Ala His Ala Leu Gln Pro Ala Ala Ala Ile Leu Ala Leu Leu Pro Ala
100 105 110

Leu Gly Leu Leu Leu Trp Gly Pro Gly Gln Leu
115 120

<210> 7
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<213> MURINE PSCA (mPSCA)

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20 25 30
Arg Asp Cys Leu Asn Val Gln Asn Cys Ser Leu Asp Gln His Ser Cys
35 40 45
Phe Thr Ser Arg Ile Arg Ala Ile Gly Leu Val Thr Val Ile Ser Lys
50 55 60
Gly Cys Ser Ser Gln Cys Glu Asp Asp Ser Glu Asn Tyr Tyr Leu Gly
65 70 75 80
Lys Lys Asn Ile Thr Cys Cys Tyr Ser Asp Leu Cys Asn Val Asn Gly
85 90 95
Ala His Thr Leu Lys Pro Pro Thr Thr Leu Gly Leu Leu Thr Val Leu
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Cys Ser Leu Leu Leu Trp Gly Ser Ser Arg Leu
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<210> 8
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<212> DNA
<213> Artificial Sequence

<220>
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 aacattaaag actactatat aactgggtg aatcagaggc ctgaccaggg cctggagtgg 180
 attggatgga ttgatcctga gaatggtgac actgaatttg tcccgaagtt ccagggaag 240
 gccactatga ctgcagacat tttctccaac acagcctacc tgcacctcag cagcctgaca 300
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 20 25 30
 Leu Ser Cys Thr Ala Ser Gly Phe Asn Ile Lys Asp Tyr Tyr Ile His
 35 40 45
 Trp Val Asn Gln Arg Pro Asp Gln Gly Leu Glu Trp Ile Gly Trp Ile
 50 55 60
 Asp Pro Glu Asn Gly Asp Thr Glu Phe Val Pro Lys Phe Gln Gly Lys
 65 70 75 80
 Ala Thr Met Thr Ala Asp Ile Phe Ser Asn Thr Ala Tyr Leu His Leu
 85 90 95
 Ser Ser Leu Thr Ser Glu Asp Thr Ala Val Tyr Tyr Cys Lys Thr Gly
 100 105 110
 Gly Phe Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala Ala Lys Thr
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 Thr Pro Pro Ser Val Tyr Pro Leu
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agctactgga tgcactgggt gaagcagagg cctggacaag gccttgagtg gattggaaat 180
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actgtagaca'catcctccag cacagcctac atgcagctca gcagcctgac atctgaggac 300
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 <213> SCID Mice

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      20              25              30

Lys Ala Ser Gly Tyr Thr Phe Ser Ser Tyr Trp Met His Trp Val Lys
      35              40              45

Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile Gly Asn Ile Asp Pro Gly
      50              55              60

Ser Gly Tyr Thr Asn Tyr Ala Glu Asn Leu Lys Thr Lys Ala Thr Leu
      65              70              75              80

Thr Val Asp Thr Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu
      85              90              95

Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Thr Ser Arg Ser Thr Met
      100             105             110

Ile Thr Thr Gly Phe Ala Tyr Trp Gly Gln Gly Thr Leu Val Thr Val
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 <213> SCID Mice

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tgtgtagcct ctggatttac tttcagtaat tactggatga cttgggtccg ccagtctcca 180
gagaaggggc ttgagtgggt tgctgaaatt cgattgagat ctgaaaatta tgcaacacat 240
tatgcgaggc ctgtgaaagg gaaattcacc atctcaagag atgattccag aagtcgtctc 300
tacctgcaaa tgaacaactt aagacctgaa gacagtggaa tttattactg tacagatggg 360
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453

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20 25 30
Pro Gly Gly Ser Met Lys Leu Ser Cys Val Ala Ser Gly Phe Thr Phe
35 40 45
Ser Asn Tyr Trp Met Thr Trp Val Arg Gln Ser Pro Glu Lys Gly Leu
50 55 60
Glu Trp Val Ala Glu Ile Arg Leu Arg Ser Glu Asn Tyr Ala Thr His
65 70 75 80
Tyr Ala Glu Ser Val Lys Gly Lys Phe Thr Ile Ser Arg Asp Asp Ser
85 90 95
Arg Ser Arg Leu Tyr Leu Gln Met Asn Asn Leu Arg Pro Glu Asp Ser
100 105 110
Gly Ile Tyr Tyr Cys Thr Asp Gly Leu Gly Arg Pro Asn Trp Gly Gln
115 120 125
Gly Thr Leu Val Thr Val Ser Ala Ala Lys Thr Thr Pro Pro Ser Val
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Tyr Pro Leu Ala Pro Cys Val
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<210> 18

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<212> PRT

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<212> DNA

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<220>
<223> Description of Artificial Sequence: RT-PCR PRIMER

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<221> misc_feature

<222> (33)

<223> g or t

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39

Handwritten marks: a heart shape, a cross, and some scribbles.

